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(54) A computer system for portfolio management investment functions.

(57) A computer system is disclosed for carrying out portfolio management investment functions. A number of operations computers are connected via a communications network to user systems and use a star network to fixed disk drive and tape drives. A development computer controls functions of the operations computers and user accesses, via the communications network. Complete versatility is thus achieved for portfolio management investment functions, batch processing and word processing. The operations computers are connected directly to switched or leased lines for reception and processing of parameter values. Any missing values are estimated, and calculated fund values are transmitted directly to the user systems on a regular basis.

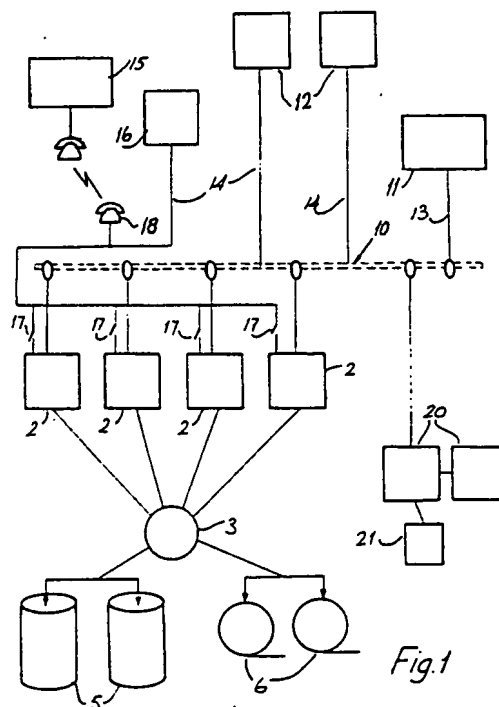


Fig.1

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64 Mbytes memory capacity and four m.i.p.s. (million instructions per second) processing capacity, the other two being of 32 Mbyte memory capacity and 1.6 m.i.p.s. processing capacity. The operations computers 2 are connected by the star network 3 to two fixed disk drives 5 and to two back-up tape drives 6, having a combined memory capacity of 5 Gbytes.

The operations computers 2 are connected by a communications network 10 to user interface devices in an in-house user system 11, and in remote user systems 12. Direct cable connections 13 are used for the in-house user system 11 and leased lines 14 are used for the remote user systems 12. The operations computers 2 are arranged to be also connected directly, by-passing the network 10 to remote information sources 15 via switched lines and to remote information sources 16 via leased lines 14. The optional connections are illustrated by switches 17. Modems 18 (only one of which is illustrated) are used for the switched and leased lines.

In addition to the operations computers 2, the data processing system 1 also includes development computers 20 having memory disks 21, for carrying out development work including coding of programs, controlling access to the operations computers 2 and developing and enhancing the structure of databases of the operations computers 2. Such work is carried out via the network 10.

Referring now to Fig. 2, the in-house user system 11 is illustrated in more detail. The user system 11 comprises a number of micro-computers 25 having associated printers 26, and a number of terminals 27, some of which have associated printers 28. There are also printers 29 connected directly to the network 10.

In operation, two of the operations computers 2 perform on-line applications processing functions, a third is used for batch processing of reports and a fourth carries out word processing functions. Any of the operations computers 2 may access the fixed disk drives 5 and tape drives 6 for access to stored data. Each operations computer 2 has access via the star network 3 to the other operations computers 2 to allow transfer of data if the functions of an operations computer 2 are to be transferred to another operations computer. In this case, data is written to the fixed disk drives 5 and read by the relevant operations computers 2. The network 10 is arranged by the development computers 20 to direct user access to whichever of the operations computers 2 is required.

The information sources 15 and 16 are connected directly to the relevant operations computer because the network 10 is arranged to handle user access codes, which codes would not be used by information sources.

In this case, one of the operations computers 2 is arranged to carry out processing functions for a portfolio management investment system and is connected to a leased line 14 for a remote information source 16 and to a switched line for a remote information source 15.

Generally, such functions involve real-time processing of transactions including deals, bargains, money in and money out, transfers, rights, bonuses, currency switches and broker settlements. In addition, databases are updated with information on a daily basis regarding various bond and equity prices. Such prices are received both from stock brokers within the particular country and from foreign information sources. The portfolio management investment functions include the carrying out of unitised valuations, distribution processing, the handling of enquiries, the carrying out of commission analysis and management reporting, the carrying out of client/stock analysis reporting (including asset distribution) and broker settlements. The outputs from the system consequent to such functions include the printing of advice notes, of contracts, of client performance reports, of dividend vouchers and of schedules.

In order for such functions to be effective it is essential that the computer system 1 include stored databases which are updated regularly, at least once a day and preferably more often than this. In order to do this, one must use information not only from local stock markets but also from international stock markets throughout the world. This has heretofore been quite a difficult problem because of the time differentials of countries.

In this embodiment, the information sources 16 are within the country and the information sources 15 are abroad.

Information relating to the local stock market is transmitted late in the evening when the stock market has closed. This information is transmitted to an operations computer 2 during normal working hours.

Information from many foreign countries becomes available only during night-time and the computer system 1 is arranged to receive such information according to the procedure of Fig. 3. Firstly, in step 30 the modems 18 are programmed to automatically answer and to receive a request for transmission of information from the information source 15. The modem 18 is also arranged to carry out error detection comparisons in step 31 and to subsequently re-transmit the verified information to the relevant operations computer 2 in which it is temporarily stored in step 32 in memory namely, a relational database of the fixed disk drives 5. The relevant operations computer 2 then carries out a check in step 33 to see if all of the required information (in this case values of various financial

the system (1) includes modulation and demodulation devices (18) operating on telecommunication lines (14) and connected directly to the selected operations computer (2) for reception of real-time information including current values of portfolio investment parameters, the modulation and demodulation devices (18) being arranged to receive said information automatically and to verify that the information is in a pre-defined format; and
the selected operations computer comprises:-
an input interface circuit for receiving (30,31) and storing (32) in random access memory said information;
a comparator circuit for verifying (33) if values for all of a pre-defined list of parameters have been received;
a processing circuit having means for estimating values (34) of parameters for which values have not been received based on a stored next previous value for that parameter and on current market indicators, and for storing (35) estimated values in random access memory, the processing circuit also comprising means for calculating (36) fund prices based on the parameter values stored in random access memory; and
an output interface circuit for generating (37) a report for said fund prices and for automatically transmitting said report to the user interface devices via the communications network.

2. A computer system (1) as claimed in claim 1 wherein said cluster controller comprises a star network (3).

3. A computer system (1) as claimed in claims 1 or 2, wherein the processing circuit comprises means for estimating (34) parameter values of Government Stocks based on a determination of the relevant coupon rate, number of days since the previous dividend issued and of the capital element.

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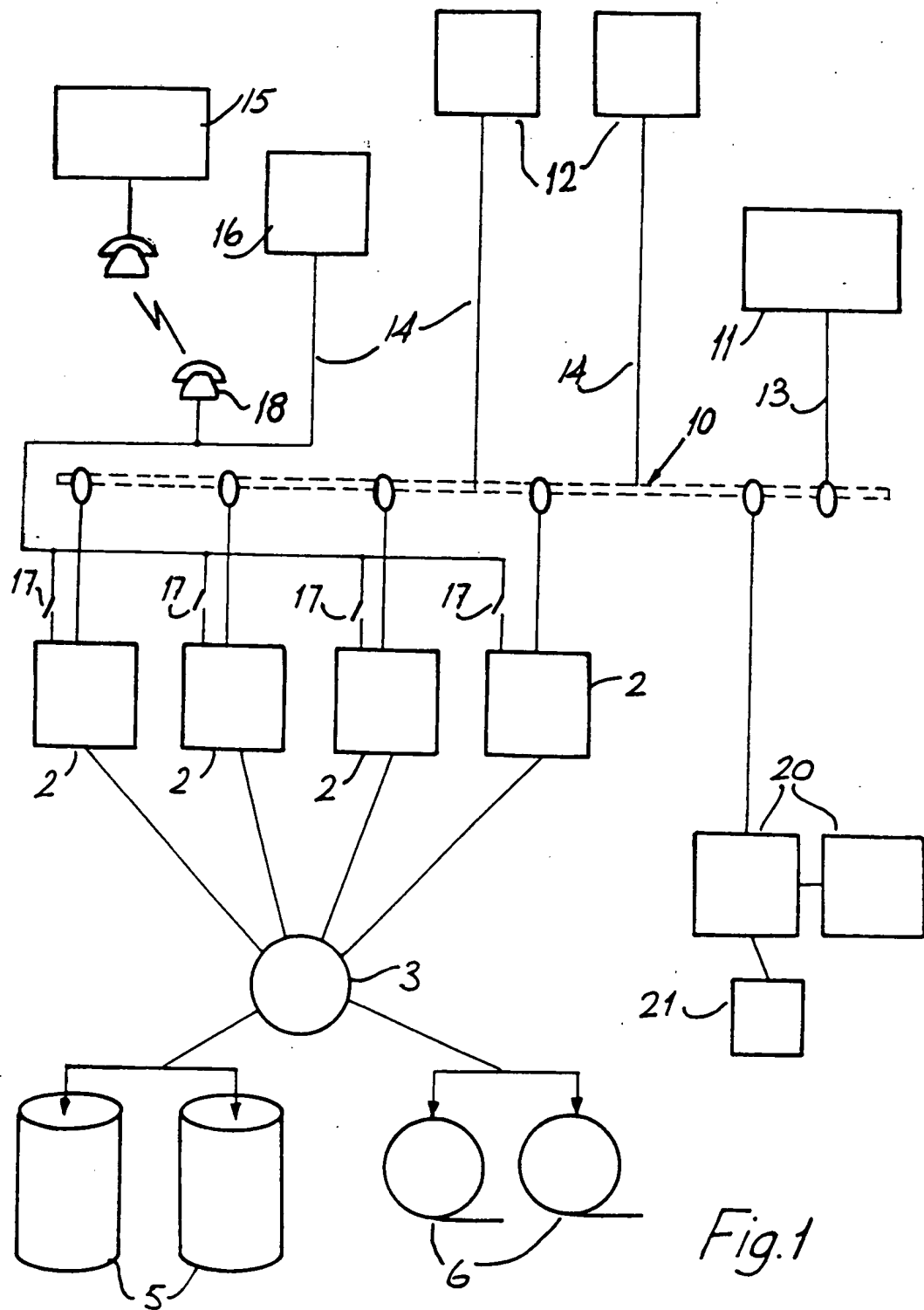


Fig.1

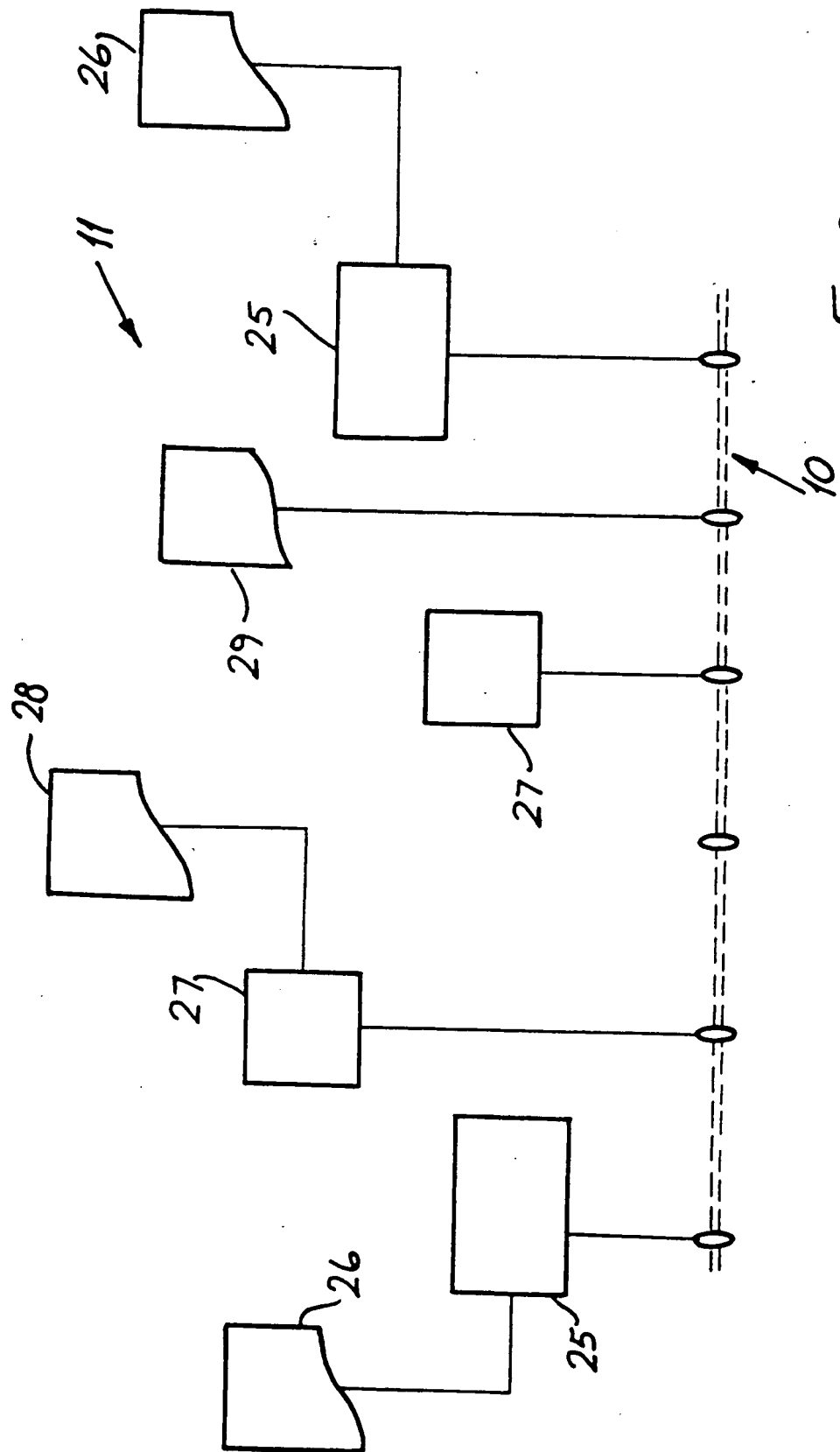
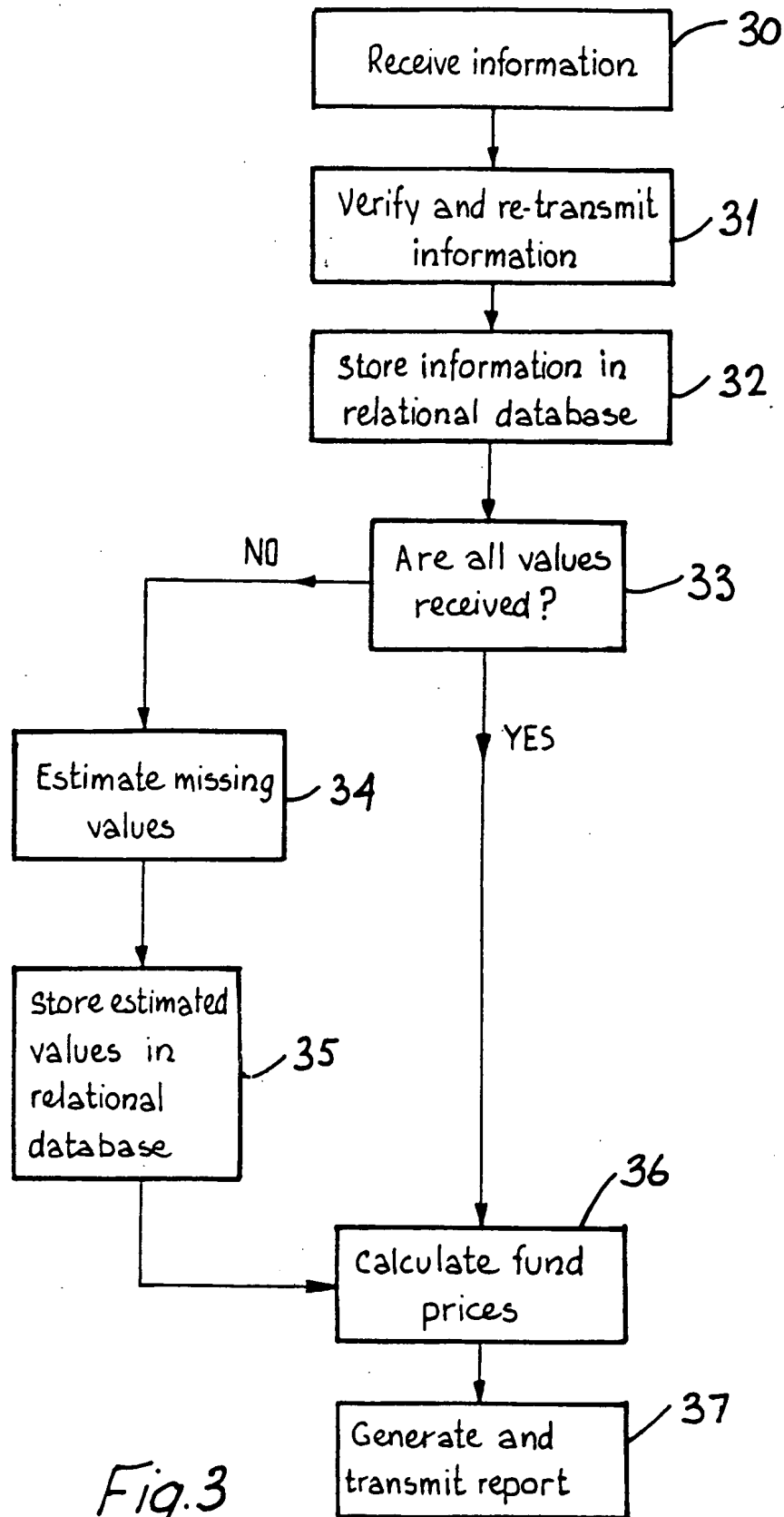


Fig. 2

*Fig.3*



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 89 31 3710

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 5)
A	DATAMATION, vol. 22, no. 7, July 1976, pages 54-56, Barrington, US; J.D. FOSTER: "Distributive processing for banking" * Page 54, left-hand column, line 1 - page 56, left-hand column, line 12 *	1	G 06 F 15/30
A	EVOLUTIONS IN COMPUTER COMMUNICATIONS, PROCEEDINGS OF THE FOURTH INTERNATIONAL CONFERENCE ON COMPUTER COMMUNICATION, Kyoto, 26th-29th September 1978, pages 467-472, North-Holland Publishing Co., Amsterdam, NL; Y. YOSHINO et al.: "New data communication system for nationwide banking activities and development of its software" * Page 467, section 2.0 - page 468, section 2.3, paragraph (B) *	1	
A	US-A-4 376 978 (MERRILL LYNCH PIERCE, FENNER & SMITH) * Column 1, line 9 - column 9, line 66 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. 5)
A	EP-A-0 278 132 (COLLEGE SAVINGS BANK) * Page 2, line 4 - page 5, line 40, figures *	1	G 06 F 15/30 G 06 F 15/24
D,A	EP-A-0 082 225 (IBM)	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17-07-1990	Examiner CHUGG D.J.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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